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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/667,006	09/21/2000	Young W. Kwon	2658-0222P	8776

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EXAMINER	
DUONG, THOI V	

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 10/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/667,006	KWON ET AL.	
	Examiner	Art Unit	
	Thoi V Duong	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 23 September 2003 .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-22 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-22 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. Applicant's arguments with respect to claims 1-22 have been fully considered and are persuasive. Therefore, the final rejection filed May 23, 2003 has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of USPN 6,075,581 of Shirochi.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1 and 3-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakashima et al. (USPN 6,141,123) in view of Shirochi (USPN 6,075,581).

As shown in Figs 12A-12D, Nakashiwa discloses a method for fabricating a holoqram diffuser which comprises:

providing a substrate 219;

forming a resin layer 210 on the substrate; and

forming a hologram pattern in the resin laver,

wherein forming the hologram pattern includes:

locating an original hologram plate 213 at an upper portion of the resin laver; pressing to form a hologram pattern in the resin layer (col. 16, lines 45-50);

hardening the resin, wherein the resin laver is made from a thermal hardening resin, and further including the step of curing the resin layer by applying heat; and

wherein the resin layer is made from an ultraviolet hardening resin, and further including the step of curing the resin layer by applying ultraviolet light (col. 18, lines 26-31); and

removing the original hologram plate (col. 18, lines 19-25).

Nakashima et al. also discloses that the resin layer formed of polycarbonate (col. 4, lines 36-39) is coated on the substrate (col. 15, lines 59-65) and has a thickness of 10 micrometers (col. 16, lines 24-26).

Nakashima et al. discloses a method that is basically the same as that recited in claims 1 and 3-9 except for a smoothing layer which smoothes the surface of the hologram pattern and activates light beam diffusion at the hologram pattern.

As shown in Fig. 11, Shirochi discloses a liquid crystal display comprising a diffraction grating 51 and an adhesive transparent resin 53 having a refractive index different from that of the grating surface 51a of the diffraction grating 51 (col. 19, lines 4-12). Accordingly, this resin layer is a smoothing layer which smoothes the surface of the diffraction grating and activates light beam diffusion at the diffraction grating. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method for fabricating a hologram diffuser of Nakashima et al. with the teaching of Shirochi by forming a smoothing layer for smoothing the surface of the hologram pattern and activating light beam diffusion at the hologram pattern.

With respect to claim 7, as known in the art, spin coating, knife coating or extrusion coating may be used for forming the resin layer on the substrate.

With respect to claim 8, it is obvious that the smoothing layer is formed to have a desired thickness of 0.1 to 5 micrometers so as to secure the hologram layer in place as well as to obtain a thin display.

Finally, with respect to claim 9, as known in the art, the refractive index of polycarbonate is 1.586 and that of transparent resin is from 1.5 to 2.0. Accordingly, with proper selection, the smoothing layer formed of transparent resin will have a refractive index difference of greater than 0.1 compared to the refractive index of the resin layer formed of polycarbonate.

4. Claims 2, 10-14 and 17-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirochi (USPN 6,075,581) in view of Nakashima et al. (USPN 6,141,123).

As shown in Fig. 11, Shirochi discloses a liquid crystal display (LCD) comprising:

a lower polarizer 24,

a lower substrate 22 arranged at an upper portion of the lower polarizer,

switching devices arranged in a matrix on the substrate (col. 18, lines 54-59);

a liquid crystal layer 21 provided at an upper portion of the lower substrate;

a color filter layer 18 formed on the liquid crystal layer (col. 18, lines 60-65);

an upper substrate 52 arranged on the color filter;

an upper polarizer 25 arranged above the upper substrate;

a diffraction grating 51 arranged between the upper substrate and the upper polarizer for diffusing light (col. 19, lines 22-28); and

a smoothing layer 53 (an adhesive transparent resin) provided at the upper portion of the diffraction grating 51, wherein the smoothing layer smoothes a surface of the hologram layer and activates light beam diffusion at the diffuser since the smoothing layer has a refractive index different from that of the grating surface 51a of the diffraction grating 51 (col. 19, lines 4-12); and

a back light unit 12 disposed below the lower polarizer.

Shirochi discloses a LCD that is basically the same as that recited in claims 2, 10-14 and 17-22 except that the diffraction grating is not specified as a hologram diffuser. As shown in Fig. 13, Nakashima discloses a hologram layer 201 comprising a resin selected from a thermal hardening resin and an ultraviolet hardening resin (col. 8, lines 53-67),

wherein the hologram layer is formed of polycarbonate (col. 4, lines 36-39), diffuses light (col. 1, lines 6-11) and has a thickness of 10 micrometers (col. 16, lines 24-26); and

wherein a shape of the hologram layer pattern controls a range of visual angle (col. 1, lines 6-11).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the LCD of Shirochi with the teaching of Nakashima et al. by employing a hologram diffuser arranged between the color filter and the upper substrate so as to obtain a wide range of visual angle for the display.

With respect to claim 11, as known in the art, the refractive index of polycarbonate is 1.586 and that of transparent resin is from 1.5 to 2.0. Accordingly, with

proper selection, a refractive index difference between the smoothing layer formed of transparent resin and the hologram diffuser formed of polycarbonate is greater 0.1.

Finally, with respect to claim 13, it is obvious that the smoothing layer is formed to have a desired thickness of 0.1 to 5 micrometers so as to secure the hologram layer in place as well as to obtain a thin display.

5. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirochi (USPN 6,075,581) in view of Nakashima et al. (USPN 6,141,123) as applied to claims 2, 10-14 and 17-22 above and further in view of Abileah et al. (USPN 5,629,784).

The LCD of Shirochi as modified in view of Nakashima includes all that is recited in claims 15 and 16 except for a twisted nematic liquid crystal display and the upper and lower polarizers are crossed perpendicular to each other. As shown in Fig. 3, Abileah discloses a twisted nematic liquid crystal display comprising a nematic liquid crystal 9 disposed between an upper polarizer 15 and a lower polarizer 3, wherein the transmission axes of the upper polarizer and the lower polarizer are crossed perpendicular to each other for rendering normally white display (col. 8, line 56 through col. 9, line 2). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the LCD of Shirochi with the teaching of Abileah et al. by employing a twisted nematic LCD having the upper polarizer and the lower polarizer crossed perpendicular to each other so as to obtain a normally white display.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thoi V. Duong whose telephone number is (703) 308-3171. The examiner can normally be reached on Monday-Friday from 8:00 am to 4:30 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached at (703) 305-3492.

Thoi Duong

10/07/2003

T. Chowdhury
Primary Examiner